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32175	7590	01/04/2007		
BORGWARNER INC. 3850 HAMLIN ROAD AUBURN HILLS, MI 48326			EXAMINER MCNELIS, KATHLEEN A	
			ART UNIT	PAPER NUMBER
			1742	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	01/04/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/766,154

Applicant(s)

XU ET AL.

Examiner

Kathleen A. McNelis

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7,9-13 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) 22-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Claims Status

Claims 1-7, 9-13 and 22-24 remain for examination wherein claims 1 and 10 are amended and claims 22-24 are withdrawn from consideration.

Examiner's Comments

Examiner has interpreted "sequential" in view of definition (1b) in Webster's Dictionary, (definition (1a) is not applicable). Definition (1b) incorporates "consecutive" and "serial" in the definition, which have been interpreted in view of Webster's Dictionary definition (1a) for "consecutive" and (1a) for "serial". This definition does not preclude additional, un-recited process steps.

Status of Previous Rejections

The previous rejection of claims 1-7 and 9-13 under 35 U.S.C. 103(a) as unpatentable over Kosco (U.S. Pat. No. 6,338,747) in view of Baran et al., Graupner et al. (U.S. Pat. No. 6,134,786) and Kempe et al. (U.S. Pat. No. 6,213,177) is withdrawn in view of amendments to the claims.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 1742

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosco (U.S. Pat. No. 6,338,747) in view of the ASM Handbook (Vol. 7) or Graham (1998).

Kosco discloses a method for producing a powder metallurgical material suitable for manufacturing gears or sprockets (col. 1 lines 1-30).

With respect to claims 1 and 10, Kosco discloses the following sequence of steps:

1. A powder (col. 6 line 63- col. 7 line 33), equivalent to instant claims 1 and 10, step (a);
2. Compressing in a mold at a pressure more preferably in the range of 35 to 50 tsi (col. 7 lines 34-41), which is within the claimed ranges of 30 to 65 tsi (claim 1 step (b)) and overlaps the claimed range of 45 tsi (claim 10 step (b)); therefore a prima facie case of obviousness exists (see M.P.E.P § 2144.05);
3. Sintering (i.e. heating) to a temperature within the range of 2000 to 2400 °F for at least 20 minutes to homogenize the alloy (col. 7 lines 42-58). The range of 2000 to 2400 °F for ≥ 20 minutes overlaps the claimed range of 1400 to 2000°F for 20 to 60 minutes (instant claim 1 step (c)); therefore a prima facie case of obviousness exists (see M.P.E.P

§ 2144.05). The range of 2000 to 2400 °F for ≥ 20 minutes is close enough to the claimed range of 1650 °F for 30 minutes (instant claim 10 step (c)), that one of ordinary skill in the art would expect the same results, therefore a prima facie case of obviousness exists (see M.P.E.P. § 2144.05). Further, it is well settled that where the principal difference between a claimed process and that taught by reference is a temperature difference, it is incumbent upon applicants to establish the criticality of that difference (Ex parte Khusid, et al., 174 USPQ 59);

4. Cooling at a rate of no greater than about 60 °F/minute to attain a density of 6.2 to 7.2 g/cc (col. 7 line 58- col. 8 line 6), which overlaps the claimed range of cooling at a rate of 10 to 120 °F/minute (claim 1 step (d)) and 25 °F/minute (claim 10 step (d));
5. Densification of at least a region of the compact to improve such properties as tensile strength or fatigue resistance (col. 8 line 7-59). While this step is not recited in instant claims 1 and 10, the preamble of claims 1 and 10 uses the term “comprising.” The transitional term “comprising”, which is synonymous with “including,” “containing,” or “characterized by,” is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. (See M.P.E.P. 2111.03). Alternatively, it would have been obvious to one of ordinary skill in the art to omit this step if further densification to between 7.6 and 7.85 is not desired and/or if increased tensile strength or fatigue resistance is not desired (see M.P.E.P. 2144.04 II);
6. Heating to a sintering temperature of 2050 to 2400 °F for times-at-temperature as discussed in the initial sintering step (col. 8 lines 60-64), (i.e. at least 20 minutes in step 3 above) which overlaps the claimed range of 2050 to 2400 °F for 30 to 90 minutes (claim 1, step (f)) and 2070 °F for 30 minutes (claim 10 step (f));
7. Cooling at an accelerated rate of at least 120 °F/minute (col. 8 line 64 – col. 9 line 16), which overlaps the claimed range of 120 to 450 °F/minute (claim 1, step (g)) and 150 °F/minute (claim 10, step (g)); and

8. Tempering (i.e. heating) at 300 – 1350 °F for 0.5 to 2 hours (col. 9 lines 17-38), overlapping the claimed range of 300 – 1000 °F for 30 to 90 minutes (claims 1 and 10, step (h)).

Kosco does not recite machining or grinding the compact to produce a profile with detailed surface geometry without substantial densification (claims 1 and 10 step (e)).

The ASM Handbook teaches that powder metallurgy is a near-net shape manufacturing process, wherein the use of machining is reduced, but still necessary for applications such as producing holes or other re-entrants normal to the pressing/compaction direction (p. 671). The ASM Handbook teaches that for making holes through (i.e. machining) a high performance PM steel, the hole should be drilled following a presintering step but prior to sinter hardening the steels (p. 674). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform machining or grinding as taught by the ASM Handbook, in the process of Kosco to produce parts with holes or other re-entrants normal to the pressing/compaction direction as taught by the ASM Handbook. Further, it would have been obvious to one of ordinary skill in the art to perform the machining or grinding as taught by the ASM Handbook between steps 3-4 (homogenization and densification sintering/cooling in Kosco) and steps 6-7 (sinter hardening in Kosco) which correspond respectively to presintering and sinter hardened in the ASM Handbook. Additionally, the selection of any order of performing process steps is prima facie obvious in the absence of any new or unexpected results (MPEP section 2144.04 IV, C).

Alternatively, Graham teaches that although the PM industry hopes eventually to eliminate machining, most PM parts are “near net shape” and require finish machining to achieve final size (p. 1). Graham teaches that porosity degrades the tool tip (pp. 1-2) and high particle hardness

Art Unit: 1742

causes rapid edge wear (p. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform machining as taught by Graham on the parts produced by Kosco, since Graham teaches that most PM parts are “near net shape” and require finish machining to achieve final size. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the machining after steps 3-4 (homogenization and densification sintering/cooling in Kosco) to reduce degradation of the tool tip as taught by Graham, and before steps 6-7 (sinter hardening in Kosco) to reduce edge wear due to higher particle hardness as taught by Graham. Additionally, the selection of any order of performing process steps is prima facie obvious in the absence of any new or unexpected results (MPEP section 2144.04 IV, C).

With respect to claims 2 and 11, Kosco discloses that the method is suitable for sprockets (col. 1 lines 1-29).

With respect to claims 3 and 4, Kosco discloses densification to between 6.2 and 7.2 g/cc (col. 3 lines 35-51), which overlaps the claimed ranges of 6.7 to 7.2 g/cc (claim 3) and 6.5 to 7.25 g/cc (claim 4), therefore a prima facie case of obviousness exists.

With respect claims 5 and 9, Kosco discloses that in the third step, heating is preformed to homogenize the alloy and after slow cooling results in hardness of less than RC 25, preferably less than RB 100 or 80 (col. 7 line 41 – col. 8 line 6), which corresponds to the condition after instant claim 1 step (d). After the sixth heating step, the alloy is rapidly cooled forming a primarily martensitic microstructure (col. 9 lines 1 – 10). Although not recited, one of ordinary skill in the art would expect that the microstructure formed after steps 3-4 of Kosco is predominantly Pearlite, ferrite + Pearlite or bainite based on the hardness, slow cooling and ability to form martensite after reheating and rapid cooling. The range of “predominantly” martensite overlaps the claimed range

Art Unit: 1742

of greater than 90% martensite. Further, since the composition is essentially the same as the disclosed invention (see below regarding claims 12 and 13), and since the process of fabrication is essentially the same as the instant invention (see above regarding claim 1), one of ordinary skill in the art would expect that the microstructure would be essentially the same or similar during each processing step (see M.P.E.P. 2112.01 II).

With respect to claims 12 and 13, Kosco discloses a general composition (col. 5 line 31 – col. 5 line 67) overlapping the instant claimed ranges as follows:

Element	Kosco	Instant claim 12		Instant claim 13	
		claimed	overlap	claimed	overlap
Fe	Iron based	iron	Iron	iron	Iron
C	0.3 – 0.8	0.3 – 1.0	0.3 – 0.8	0.8	0.8
Cr	< 4.0	0- 4.0	0 – 4.0	---	0
Cu	1.0 – 3.5	0 – 3.0	1.0 – 3.0	2.0	2.0
Mo	< 2.0	0.5 – 1.5	0.5 – 1.5	1.25	1.25
Ni	< 2.0	0.5 – 4.5	0.5 – 2.0	1.4	1.4
Mn	< 0.7	0 – 1.0	0 – 0.7	0.42	0.42
Si	---	0 – 1.5	0	---	0

Therefore a prima facie case of obviousness exists (see M.P.E.P § 2144.05). Note that while Kosco does not recite silicon, the lower limit in claim 12 is zero, and Si is not recited in claim 13, therefore the presence of silicon is not required in the instant claims.

Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosco (U.S. Pat. No. 6,338,747) in view of the ASM Handbook (Vol. 7) as applied to claim 1.

Kosco in view of the ASM Handbook is applied as set forth above regarding claim 1.

The ASM Handbook further discloses that compound gears (i.e. multiple rows of teeth) can be made by pressing powder (p. 346), and that grinding of P/M parts may be necessary to achieve dimensional functionality of a part (p. 686). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by the

ASM Handbook in the process of Kosco to achieve dimensional functionality of parts as taught by the ASM Handbook.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosco (U.S. Pat. No. 6,338,747) in view of Graham (1998) as applied to claim 1, and further in view of Graupner et al. (U.S. Pat. No. 6,134,786).

Kosco in view Graham is applied as set forth above regarding claim 1.

Kosco in view of Graham does not disclose grinding.

Graupner et al. discloses that gear teeth can become misaligned during manufacturing, and teaches that grinding can re-generate gear teeth relationships (col. 5 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by Graupner et al. in the process of Kosco et al. to re-generate gear teeth relationships as taught by Graupner et al.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosco (U.S. Pat. No. 6,338,747) in view of Graham (1998) as applied to claim 1, and further in view of Graupner et al. (U.S. Pat. No. 6,134,786) and the ASM Handbook.

Kosco in view Graham is applied as set forth above regarding claim 1.

Kosco in view of Graham does not disclose grinding to produce a surface geometry selected from the group consisting of multiple rows of teeth and undercut.

Graupner et al. discloses that gear teeth can become misaligned during manufacturing, and teaches that grinding can re-generate gear teeth relationships (col. 5 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by Graupner et al. in the process of Kosco et al. to re-generate gear teeth relationships as taught by Graupner et al.

The ASM Handbook discloses that compound gears can be produced by pressing powders (p. 346), therefore one of ordinary skill in the art would expect that the press and sinter method of Kosco in view of Graham and Graupner et al. could be used for producing compound gears (i.e. multiple rows of teeth).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-5 and 9-13 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 8-11 and 24 of copending Application No. 10/983,554 (U.S. PG Pub. 2005/0123432) in view of the ASM Handbook (Vol. 7) or Graham (1998).

With respect to instant claims 1, 5, 9 and 10, PG Pub. ‘432 claim 1 discloses a process comprising steps (a)-(g) which is essentially the same as or similar to the instant claimed steps as follows:

- '423 claim 1 Preamble: producing a part from a metallurgical powder (instant claims 1 and 10, step (a)),
- '423 Claim 1, Step (a): 25 to 65 tsi overlaps the instant recited ranges of 30 to 65 tsi (instant claim 1, step (b)) and 45 tsi (instant claim 10 step (b)),
- '423 Claim 1, Step (b): 1650 °F to 2400 °F for 20 to 60 minutes overlaps the claimed ranges of 1400 to 2000 °F for 20 to 60 minutes (instant claim 1, step (c)) and 1650 °F for 30 minutes (instant claim 10, step (c)),
- '423 Claim 1, Step (d): cooling to room temperature at a rate such that the microstructure is mainly pearlite is within overlaps or is close enough to the claimed ranges of 10 to 120 °F/min (instant claim 1, step (d)) or 25 °F/min (instant claim 10, step (d)) that one of ordinary skill in the art would expect the same result, since this is the claimed result of the cooling process (instant claim 5),
- '423 Claim 1, Step (f): sinter hardening at 1650 °F to 2100 °F for 20 to 80 minutes and cooling at a rate of 150 to 250 °F/min overlaps the claimed ranges of heating to 2000 to 2400 °F for 20 to 80 minutes (instant claim 1, step (f)) and 2070 °F for 30 minutes (instant claim 10, step (f)) and cooling at a rate of 120 to 450 °F/min (instant claim 1, step (g)) and 150 °F/min (instant claim 10, step (g)),
- '423 Claim 1, Step (g): tempering to between 300 and 1000 °F for 30 to 90 minutes is the same as instant claims 1 and 10 step h, and discloses that the compact is tempered martensite in a range overlapping greater than 90% (claim 9).

PG Pub '432 does not recite machining or grinding the compact to produce a profile with detailed surface geometry without substantial densification (claims 1 and 10 step (e)).

The ASM Handbook teaches that powder metallurgy is a near-net shape manufacturing process, wherein the use of machining is reduced, but still necessary for applications such as producing holes or other re-entrants normal to the pressing/compaction direction (p. 671). The

ASM Handbook teaches that for making holes through a high performance PM steel, the hole should be drilled following a presintering step but prior to sinter hardening the steels (p. 674). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform machining or grinding as taught by the ASM Handbook, in the process of PG Pub '432 to produce parts with holes or other re-entrants normal to the pressing/compaction direction as taught by the ASM Handbook. Further, it would have been obvious to one of ordinary skill in the art to perform the machining or grinding as taught by the ASM Handbook between steps d (sintering to produce pearlitic structure) and step f (sinter hardening) which correspond respectively to presintering and sinter hardened in the ASM Handbook. Additionally, the selection of any order of performing process steps is prima facie obvious in the absence of any new or unexpected results (MPEP section 2144.04 IV, C).

Alternatively, Graham teaches that although the PM industry hopes eventually to eliminate machining, most PM parts are "near net shape" and require finish machining to achieve final size (p. 1). Graham teaches that porosity degrades the tool tip (pp. 1-2) and high particle hardness causes rapid edge wear (p. 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform machining as taught by Graham on the parts produced by PG Pub '432, since Graham teaches that most PM parts are "near net shape" and require finish machining to achieve final size. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the machining after step d (sintering) to reduce degradation of the tool tip as taught by Graham, and before step f (sinter hardening) to reduce edge wear due to higher particle hardness as taught by Graham. Additionally, the selection of any order of performing process steps is prima facie obvious in the absence of any new or unexpected results (MPEP section 2144.04 IV, C).

With respect to instant claims 2 and 11, PG Pub '432 claim 9 discloses a sprocket.

With respect to instant claim 3, PG Pub '432 claim 10 discloses a tooth density of 6.75 to 7.25 g/cc, which overlaps the claimed range of 6.7 to 7.2 (claim 3).

With respect to instant claim 4, PG Pub '432 claim 11 discloses a density after compaction of between 6.4 to 7.4 g/cc, which overlaps the claimed range of 6.5 to 7.25 g/cc.

With respect to instant claims 12 and 13, PG Pub '432 claim 8 discloses a general composition (col. 5 line 31 – col. 5 line 67) overlapping the instant claimed ranges as follows:

Element	PG Pub '432	Instant claim 12		Instant claim 13	
		Claimed	overlap	claimed	overlap
Fe	Iron	Iron	Iron	iron	Iron
C	0.4 – 0.9	0.3 – 1.0	0.4 – 0.9	0.8	0.8
Cr	---	0- 4.0	0	---	0
Cu	0.1 – 1.5	0 – 3.0	0.1 – 1.5	2.0	See below
Mo	0.5 – 1.5	0.5 – 1.5	0.5 – 1.5	1.25	1.25
Ni	0.1-2.0	0.5 – 4.5	0.1-2.0	1.4	1.4
Mn	0.1-0.5	0 – 1.0	0.1-0.5	0.42	0.42
Si	0.1 – 1.5	0 – 1.5	0.1 – 1.5	---	0

Therefore a prima facie case of obviousness exists (see M.P.E.P § 2144.05). Note that while PG Pub '432 claim 8 does not recite chromium, the lower limit in claim 12 is zero, and Cr is not recited in claim 13, therefore silicon is not required in the instant invention. Further, PG Pub '432 claim 3 recites chromium. While the range disclosed in PG Pub '432 claim 8 for copper is lower than the claimed range in instant claim 13, PG Pub '432 claim 24 discloses that the copper can be increase dot 2.0 wt % in an alloy that is essentially the same or similar.

Claims 6 and 7 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/983,554 (U.S. PG Pub. 2005/0123432) in view of the ASM Handbook as applied to instant claim 1.

PG Pub '432 in view of the ASM Handbook is applied as set forth above.

The ASM Handbook further discloses that compound gears (i.e. multiple rows of teeth) can be made by pressing (p. 346), and teaches that grinding of P/M parts may be necessary to achieve dimensional functionality of a part (p. 686). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by the ASM Handbook in the process of PG Pub '432 to achieve dimensional functionality of parts as taught by the ASM Handbook.

Claim 6 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/983,554 (U.S. PG Pub. 2005/0123432) as applied to instant claim 1, and further in view of Graupner et al. (U.S. Pat. No. 6,134,786).

PG Pub '432 in view of Graham is applied as set forth above regarding claim 1.

PG Pub '432 in view of Graham does not disclose grinding.

Graupner et al. discloses that gear teeth can become misaligned during manufacturing, and teaches that grinding can re-generate gear teeth relationships (col. 5 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by Graupner et al. in the process of PG Pub '432 in view of Graham to re-generate gear teeth relationships as taught by Graupner et al.

Claim 7 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 9-11 of copending Application No. 10/983,554 (U.S. PG Pub. 2005/0123432) as applied to claim 1, and further in view of Graupner et al. (U.S. Pat. No. 6,134,786) and the ASM Handbook.

PG Pub '432 in view of Graham is applied as set forth above regarding claim 1.

PG Pub '432 in view of Graham does not disclose grinding to produce a surface geometry selected from the group consisting of multiple rows of teeth and undercut.

Graupner et al. discloses that gear teeth can become misaligned during manufacturing, and teaches that grinding can re-generate gear teeth relationships (col. 5 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform grinding as taught by Graupner et al. in the process of PG Pub '432 in view of Graham to re-generate gear teeth relationships as taught by Graupner et al.

The ASM Handbook discloses that compound gears can be produced by pressing powders (p. 346), therefore one of ordinary skill in the art would expect that the press and sinter method of PG Pub '432 in view of Graham and Graupner et al. could be used for producing compound gears (i.e. multiple rows of teeth).

This is a provisional obviousness-type double patenting rejection.

Response to Arguments

Applicant's arguments with respect to claims 1-7 and 9-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

Art Unit: 1742

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571-272-3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAM
12/28/2006

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